Math 8302 **Homework 4** **PJW**

Date due: Wednesday February 20, 2002. There will be a quiz on this date.

1. Construct a map $S^3 \to S^3$ of degree -1.
2. Construct a map $S^2 \to S^2$ of degree 2.
3. Show that any map $S^2 \to S^2$ of degree 2 has a fixed point.
4. (a) Show that if $h : S^n \to S^n$ has degree $\neq 1$ then h carries some point x to its antipode $-x$.
   (b) Show that if $h : S^n \to S^n$ has degree $\neq (-1)^{n+1}$ then h has a fixed point
5. Rotman page 125, 6.16.
6. Rotman page 125, 6.17.